The Files 25 June 1956

[redacted] 25X1

1. On the 20th and 21st of June 1956 [redacted] 25X1
was visited in the company of [redacted] 25X1
The purpose of this trip was to become familiar with the work of [redacted] 25X1
[redacted] on video amplifiers and pulse stretchers, and with that of [redacted] 25X1
[redacted] on antenna design and testing. The following persons partici- 25X1
pated in the discussions:

[redacted] 25X1

The sections which follow summarize briefly the discussion which took place during this trip.

2. Video Amplifier and Pulse Stretcher [redacted] 25X1

a) The NRL data on the 4 mc video amplifier showed that if a source of 1000 ohms internal impedance is used, the bandwidth drops to about 1.3 mc. The MIT Radiation Lab Series indicates that the effective generator impedance of a microwave detector will be somewhere near 1000 ohms. However, the [redacted] have shown that when the amplifier 25X1
is actually fed by a microwave crystal, the 4 mc bandwidth is retained. [redacted] 25X1
microwave crystal expert, was consulted on the problem. [redacted] felt that the dynamic impedance of the crystal should be measured. This measurement is being made and the results will be reported to us. 25X1

b) The common emitter resistance of the first and third stages of the triplet amplifier is used because it has been found that, if the proper value is chosen, about 100% increase in bandwidth may be obtained with about 20% loss in gain. One ohm is used for the 1 mc amplifier and two ohms for the 4 mc amplifier.

c) The last stage of the video amplifier is used to drive a low impedance cable. A type 5113 (high alpha) transistor is used to maintain current gain. This stage is capacity coupled to the triplet to avoid adverse effects on the temperature stabilizing dc feedback loop.

d) The intermediate amplifier at the input to the pulse stretcher has a gain of about 1.4. Its function is to reverse the phase of the signal pulse so that it can be stretched.

e) The pulse stretcher has a gain of about 0.9. Whether or not the stretching is "linear" depends upon the circuit constants.

f) Noise from various microwave detectors into the 4 mc amplifiers was measured to be about 25 microvolts.

3. Antenna Design (AEL)

a) Development to date on the tapered helical antenna shows that a 3:1 bandwidth is possible compared with the 1.8:1 from a cylindrical helix. The effect of the end cap is to minimize the axial ratio (polarization) and the beam tilt. The nature of the base plate does not affect the performance and is dictated by mechanical requirements. The effect of increasing the cone angle to 90° is being studied.

b) A 24 to 37 kmc test source was obtained by feeding the output from a 12 to 18 kmc klystron into a harmonic generator and using the second harmonic. The harmonic is about 10 db below the fundamental.

c) Microwave parts of special design, good workmanship and fast delivery can be obtained from:

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